larger the illuminating area of the photosphere becomes the smaller will be the difference between the spectrum of the interior part of the corona and that of the exterior part, since, whatever be the extent of the illuminating surface of the photosphere, the exterior parts of the corona will only receive an excess of light over that received by the interior part equal to the amount of photospheric light received by those parts during totality, or, as in the case above taken, the excess will be equal to that given by a ring of light from the photosphere 0″·75 wide (or G E in the figure), so that, when a few seconds of photosphere are visible to the observer, the difference between the spectra of the exterior and interior parts of the corona would be inappreciable.

5. What spectrum ought the corona to give before totality on the following side of the Moon? In this case, when the angular distance of the limits of the Sun and Moon is some seconds, the difference between the spectra of the exterior and interior parts of the corona is small, since no part of the atmosphere in this case will be illuminated by the photosphere, so we ought to obtain a chromospheric spectrum, together with a faint photospheric one caused by a small amount of photospheric light reflected from the photosphere by the chromosphere.

6. On the foregoing hypothesis during totality the parts of the corona nearest the centre should give a different spectrum to the more distant portions, since the portions nearer the centre receive less photospheric light than the more distant parts, and the same amount of light from the chromosphere.

In order to test the correctness of this theory, advantage may be taken of the following facts:—1st. At that period of the eclipse when the limb of the Sun and Moon are in line with the observer, there will be a difference between the central and distant parts of the corona, and this difference will decrease as the Moon passes on, whereas, by the other theory, there should be the same difference as long as the corona is visible. 2d. If the corona be terrestrial, the spectrum of any portion of it ought to be continually changing during the passage of the Moon; but, if solar, the spectrum should remain unchanged.

On the Displacement of the Bright Lines in the Spectrum of the Solar Chromosphere. By G. M. Seabroke, Esq.

The author in reference to a letter of Father Secchi to the Academy of Sciences of 25th April, writes,—

"For some time past, Mr. Lockyer has been kind enough to allow me the use of his telescope and spectroscope to prepare myself for the observations I intend making during the ensuing eclipse; and as I have been using the same spectroscope with which the discoveries in question have been made, and which have been contested by Father Secchi, I think it right to add my independent testimony on that point."

He remarks that the displacement of the bright lines of the spectrum of the chromosphere cannot be explained in the manner attempted by Father Secchi, by the rotation of the Sun, whatever the velocity of rotation is assumed to be. "For I have frequently seen a change of wave length in the same direction in the spectrum of prominences on opposite sides of the Sun, and if the change was produced by the Sun's rotation the change must be in opposite directions, since one side is approaching and the other receding from us. I also frequently see a change of wave length in the spectrum of one part of a prominence and not in another. How does Father Secchi's theory account for this? Besides, on his hypothesis, the bright lines of the prominences should never appear curved as I often see them, but should remain perfectly straight. The black lines should, on his hypothesis, be also displaced like the bright ones, so that the bright lines would still retain their position with respect to their corresponding black line, whatever be the velocity. Perhaps every one in eight of the prominences I have seen,—and I see two or three every time I looked at the Sun,—have given decided changes of wave length; in fact, the occurrence is so frequent, that unless any extraordinary change is seen, I make no note of it, and the changes of wave length are continually varying, and seldom last more than a quarter to half an hour, which clearly shows that the Sun's rotation has nothing to do with. That there are tremendous movements in the chromosphere is certain, from (1) the alteration of wave length observed in the space of a few minutes or sometimes seconds; (2) when a prominence is observed with a wide slit a change of form can generally be detected in a few minutes;" and he annexes rough sketches of the F line of two prominences showing change of wave length.

London,
June 1, 1860.

On a Spectroscope in which the Prisms are automatically adjusted to the minimum angle of deviation for the particular Ray under examination. By J. Browning, Esq.

In an ordinary spectroscope the prisms are usually adjusted to the minimum angle of deviation for the most luminous rays in the spectrum,—by preference I adjust them myself for the ray E in the solar spectrum. This being done, the prisms are screwed, or otherwise firmly clamped, to the main plate of the spectroscope. Thus adjusted they are liable to two sources of error, one of which places the observer at a serious disadvantage. First, only the particular ray for which the prisms have been adjusted, is seen under the most favourable circumstances, for only this ray passes, as all should do, through the train of prisms parallel to the base of each prism. Of more importance than this, however, is the